REMARKS

The Examiner's indication that claims 2-3 and 7-11 are objected to and contain patentably subject matter is noted with appreciation.

The present invention is a method of generating a hybrid grid applicable to a heterogeneous medium crossed by at least one geometric discontinuity of known geometry in order to form a model representative of fluid flows in the medium in accordance with a defined and numerical pattern, structure of the medium being known a priori from available data acquired from in-situ measurements, analysis and/or interpretations of images of the medium and a method of simulating, in accordance with a defined numerical pattern, evolution of a process in a heterogeneous medium crossed by at least one geometric discontinuity of known geometry, the structure of the medium being known a priori from available data acquired through in-situ measurements analysis and/or interpretations of the images of the medium. In accordance with the method of generating a hybrid grid, a hybrid grid is formed including at least first structured grid for getting of at least a part of the medium. At least one second structure grid is formed for gridding of another part of the medium. At least one cavity is formed between the at least one first structured grid and each at least one second structured grid with a sufficient size to allow formation of at least one unstructured grid providing transition between the structured grids. Each structured grid which provides transition is formed by means of a power diagram and by imposing conformity of each unstructured grid providing transition with walls of each cavity.

Claims 1 and 5 stand rejected under 35 U.S.C. §102 as being anticipated by United States Patent 6,678,642 (Budge). The grounds of

rejections are traversed for the following reasons with respect to claims 1 and 5 and newly submitted counterpart claims 15 and 23.

With respect to claims 1 and 5 the Examiners reasons as follows:

> Regarding claim 1: Budge describes a method of generating a hybrid grid suited to a heterogeneous medium crossed by at lest one geometric discontinuity of known geometry (Abstract), in order to form a model representative of fluid flows in this medium in accordance with a defined numerical pattern (Abstract), the structure of the medium being known a priori from available data acquired through in-situ measurements (C 4, L 25-33), analyses and;or interpretation of images of the medium (FIG. 5A & FIG. 5B; C 17, L 56-66), comprising forming a hybrid grid including at least one first structured grid for gridding of at least part of the medium (FIG. 2A; C 3, L 50-65), forming at least one second structured grid for gridding of another part of the medium (FIG. 2A; C 3, L 50-65), forming at least one cavity between the at least one first structured grid and each at least one second structured grid with a sufficient size to allow formation of at least one non-structured grid providing transition between the structured grids (FIG. 2A; C 3, L 50-65), characterized in that it includes forming each non-structured transition grid by means of power diagrams and by imposing conformity of the non-structured transition grids with the walls of each cavity. (FIG. 2A, FIG. 2B, FIG. 2C, & FIG. 2D).
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> Regarding claim 5: Budge describes a method for simulating (C 1 L 10-16), in accordance with a defined numerical pattern (C 15, L 40-52), the evolution of a process such as a fluid flows in a heterogeneous medium crossed by at least one geometric discontinuity of known geometry (FIG. 3), the structure of the medium being known a priori from available data acquired through in-situ measurements (C 4, L 25-33), analyses and/or interpretations of images of the medium (FIG. 5A & FIG. 5B; C 17. L 56-66), comprising forming a hybrid grid including at least one first structured grid for gridding of at least part of the medium (FIG. 2A; C 3, L 50-65), forming at least one second structured grid for gridding of another part of the medium (FIG. 2A; C 3, L 50-65), forming at least one cavity between the at least one first structured grid and each at least one second structured grid with a sufficient size to allow formation of at least one non-structured grid providing transition between the structured grids (FIG. 2A; C 3, L 50-65), characterized in that it includes: forming the non-structured transition grids by using power diagrams and imposing conformity of the non structured transition grids with the walls of each cavity and solving the numerical pattern in the hybrid grid formed for the medium in order to model the process. (FIG. 2A, FIG. 2B, FIG. 2C & Fig. 2D).

Budge discloses a method and apparatus for modeling interactions in which two types of meshes are used for example to model three meshes as illustrated in Fig. 5A and 5B to simulate interaction of the period of time involving a hard material 101 which penetrates a soft material modelled by meshes 102 and 103. Contrary to the Examiner's assertions, Budge does not disclose forming a hybrid grid as defined in claims 1 and 5, a non-structured transition grid, utilization of a power diagram to form each non-structure transition grid, the presence of a cavity and imposing conformity of the non-structure transition grid with the walls of each cavity as recited in independent claims 1 and 5.

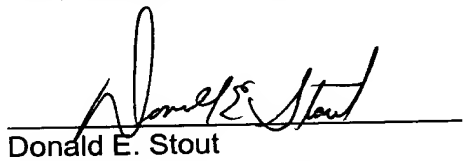
Budge discloses the use of representing two portions of problem space by a Lagrangian mesh and an ALE mesh which may be an unstructured mesh. See column 14, lines 30 et seq. However, as is clear from the time lapse illustrated in Figures 5A and 5B in which the multiple meshes 101, 102 and 103 are utilized, the objective of Budge is to model a different type of interaction which is that between a hard and soft material and a not method of generating or using a hybrid grid. The present invention as claimed pertains to discretization applied to geometric problems where Budge addresses mechanical and mathematical problems of discretization such as a finite element mechanical prediction method.

Moreover, the present invention recites three components of a hybrid grid including a first structured grid, at least one second structured grid and at least one unstructured grid providing transition between the structured grids.

In view of the foregoing amendments and remarks, it is submitted that each of the claims is in condition for allowance. Accordingly, early allowance thereof is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (Case No. 612.39353X00) and please credit any excess fees to such deposit account.

Respectfully submitted,



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Attachments